Enterprise Architecture

"Blueprints for Success: Building Strong Foundations Through Enterprise Architecture"

HIMSS Conference: 16 February 2005

Military Health System Presenters

- **Ms. Connie Gladding – Chief Enterprise Architect**
- **Ms. Sherry McKenzie – Operational Architect**
- **Ms. Nancy Orvis – Data Architect**
- **Ms. Stephanie Boyles – Technical Standards Architect**

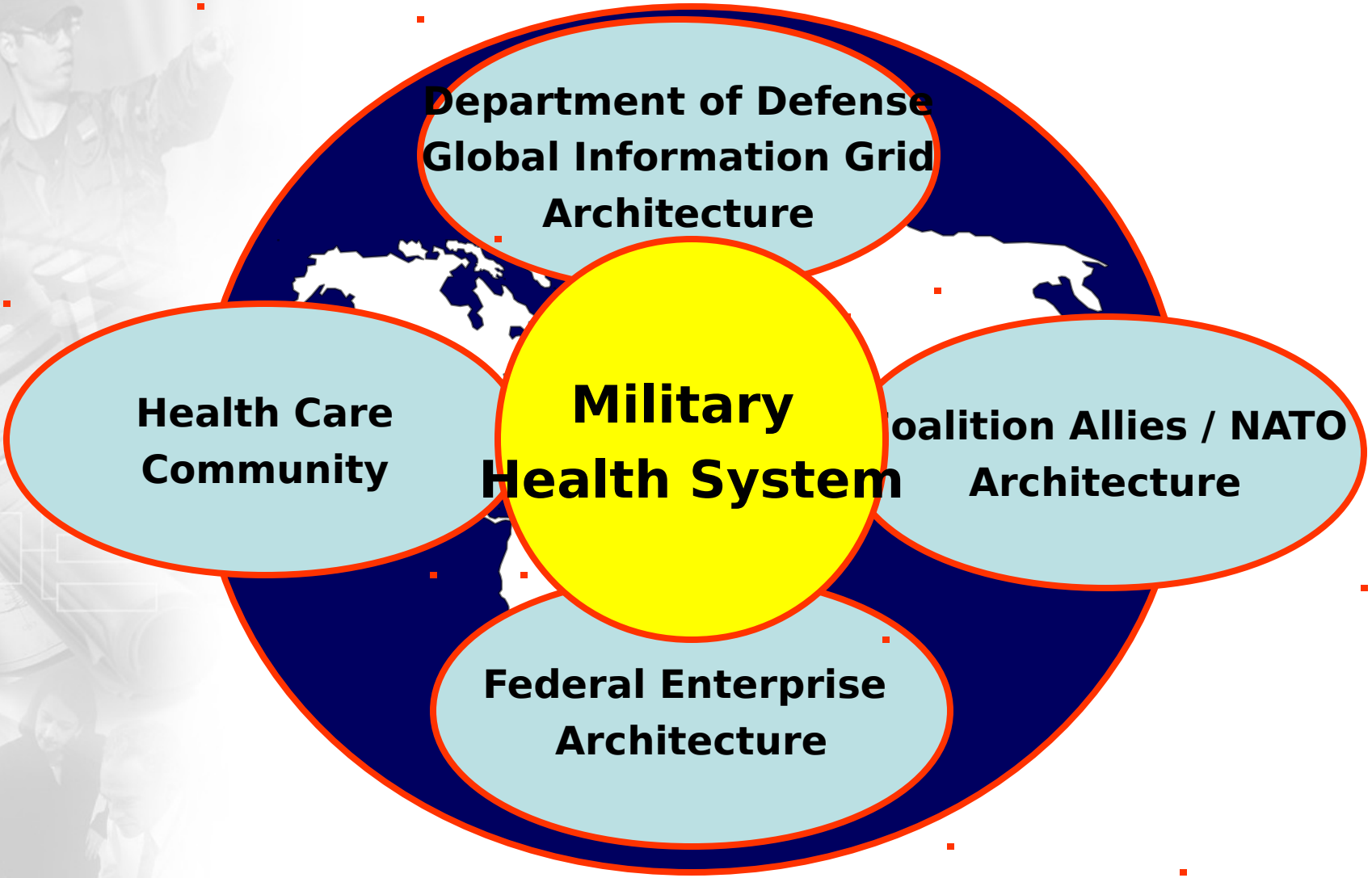
Overview

- **Describe MHS Enterprise Architecture and its benefits**
- **Identify DoD Health Enterprise Architecture components**
- **Illustrate DoD MHS Enterprise Architecture effects**

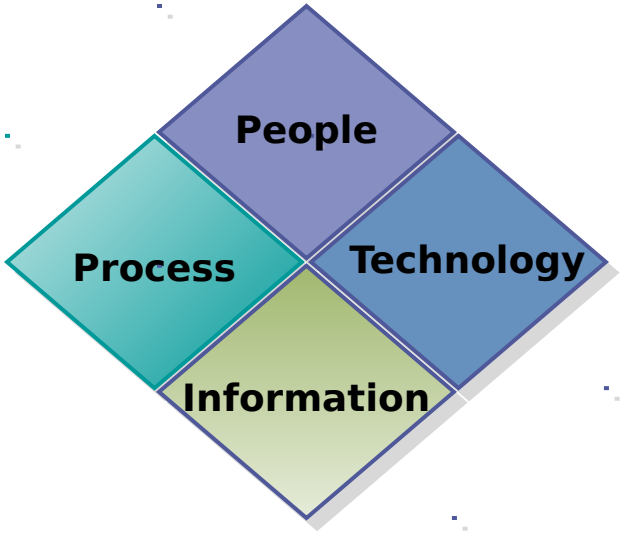
Who Are We?
Military Health System Statistics

- **$37 Billion Operations**
  - **Anticipated to be $50 billion in 5 years**
- **9.1 million eligible beneficiarie**
- **70 hospitals & medical centers**
- **411 medical clinics**
- **130,800 personnel**
- **1.7 million outpatient visits/week**

Our Military Health Environment



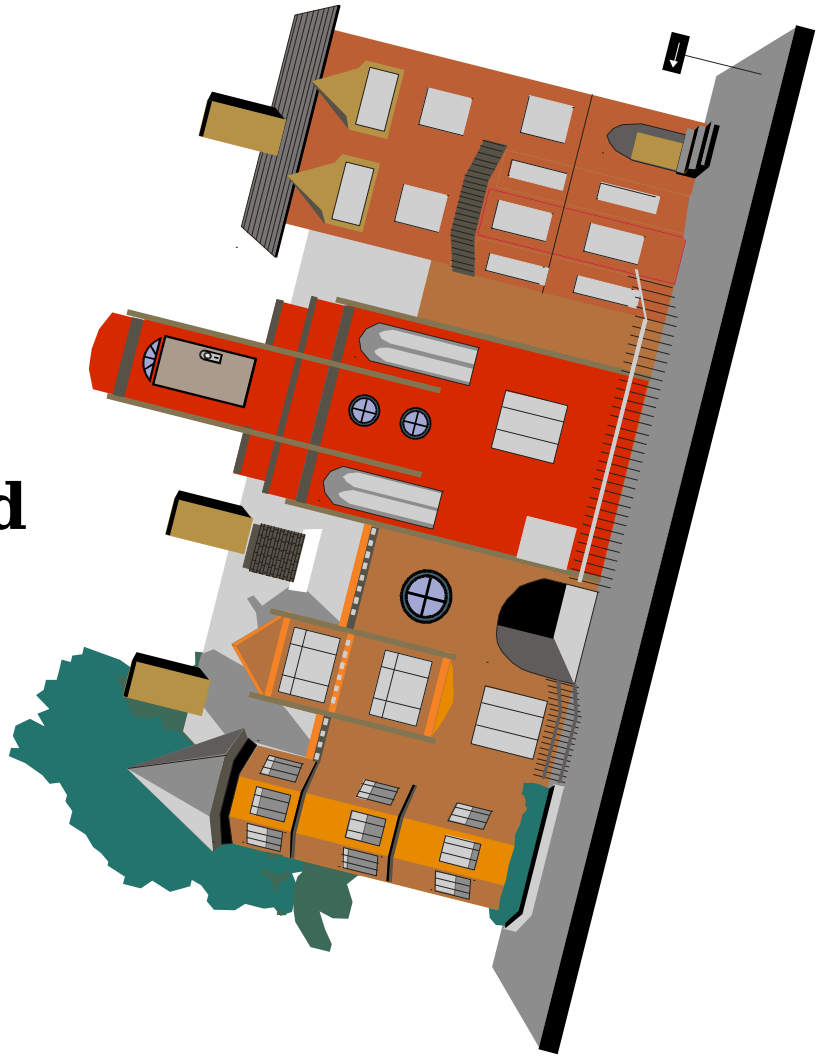
Architecture-Blueprint



Architecture development serves the same
pose as a blueprint for constructing a build

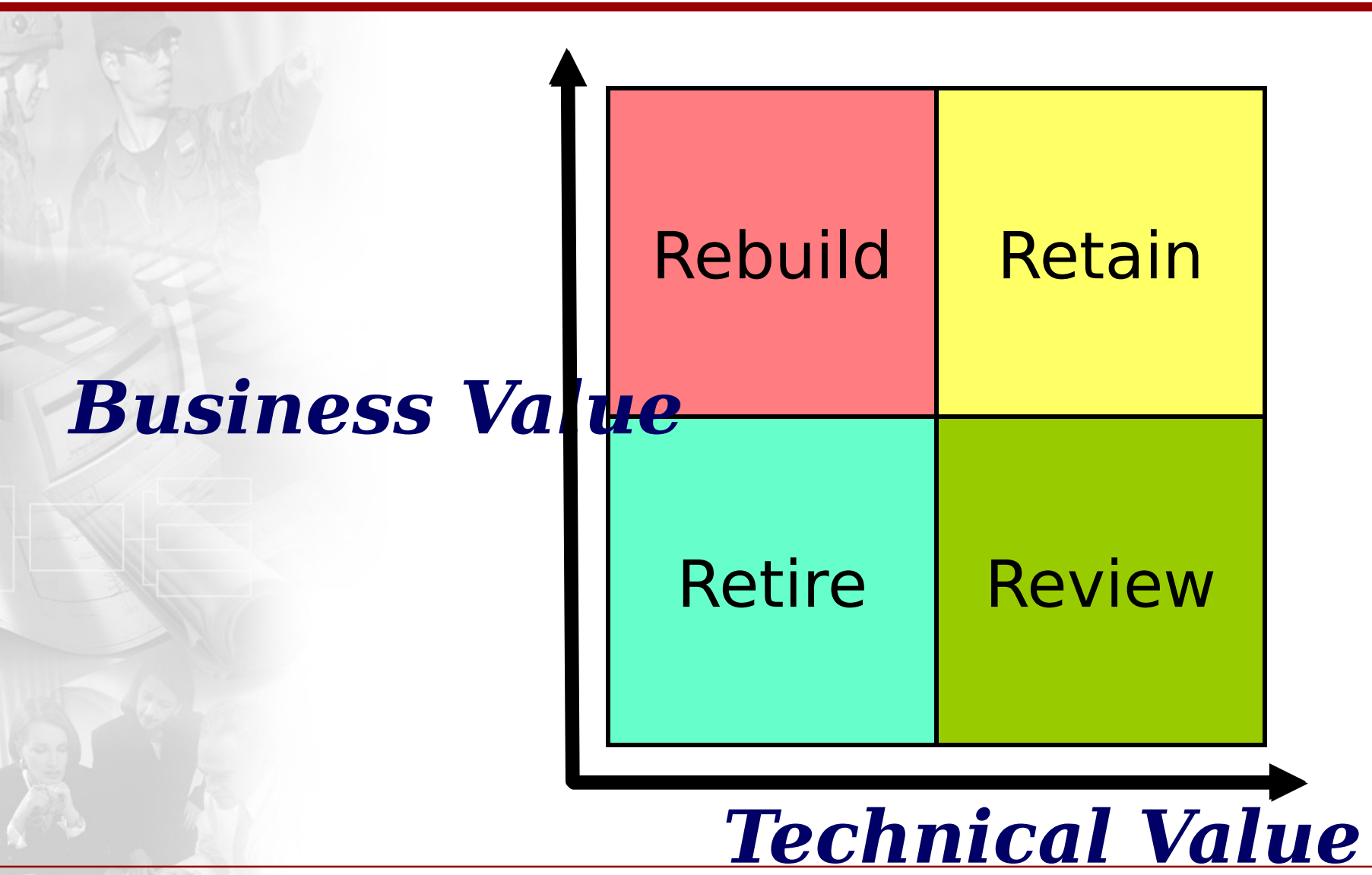
What is Enterprise Architecture?

- **Defines “Big Picture of organization and how it works together”**
- **Displays strategic, future (“To Be”) views of organization’s processes, technology, standards and their interrelationships**
- **Provides plan for transitioning processes, systems, and implementing new technologies**

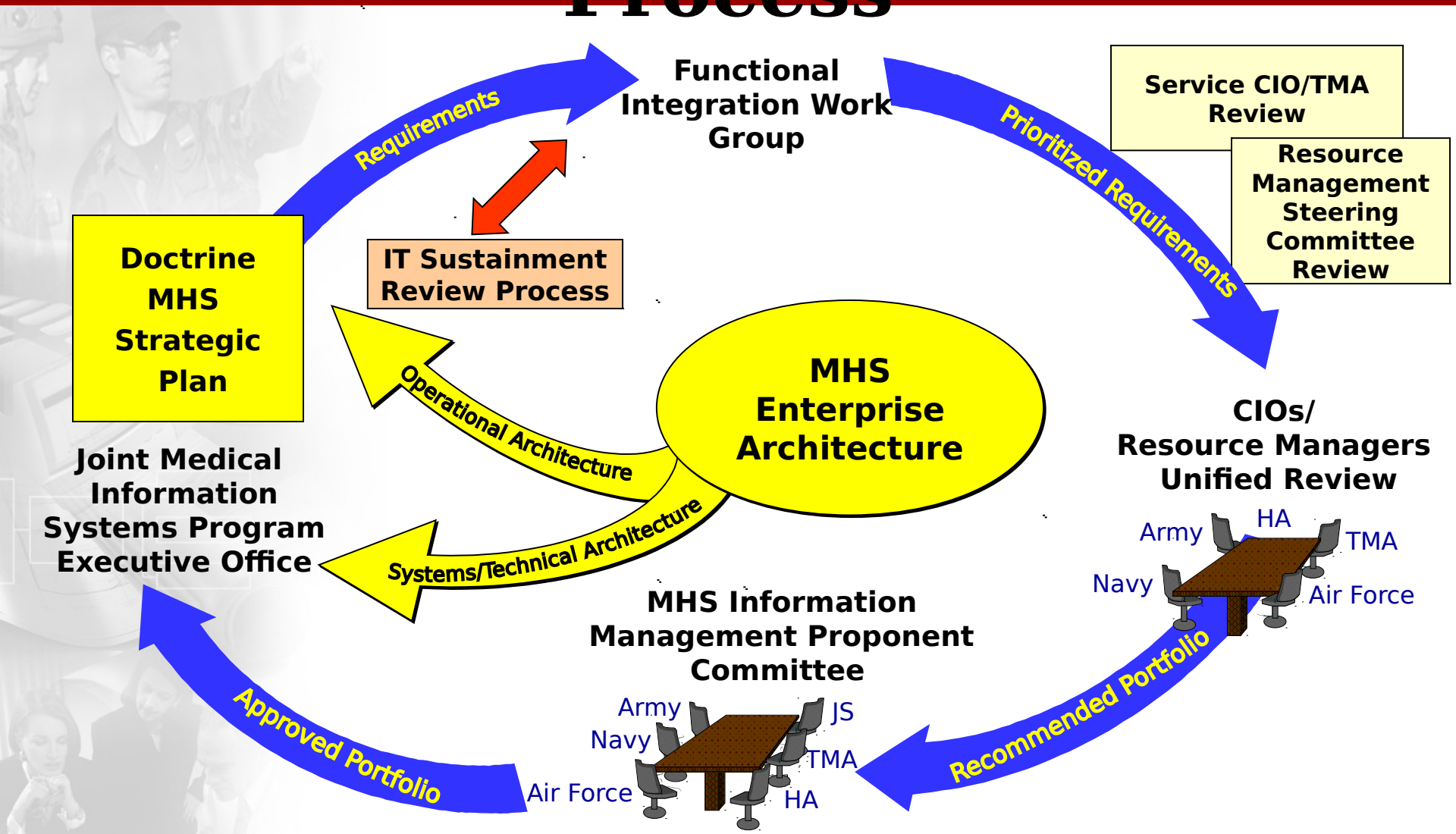


Building Towards the “To Be”

Rationalizing Applications



Military Health System IT Capital Investment Portfolio Process



Business Drivers

- MHS Strategic Plan
- Force Health Protection
- Clinger-Cohen & HIPAA
- Security/Information Assurance
- DoD Net-centric Transformation
- DoD Business Modernization
- Joint Medical Command
- Need to maximize resources
- National Electronic Health Record Initiative

Benefits of Enterprise Architecture

- Documents leaderships vision for the organization
- Guides business transformation and modernization
- Aligns investments with business priorities
- Assists in the management of complexities
- Improves efficiencies
- Improves customer satisfaction
- Improves patient safety
- Supports interoperability
- Educate staff
- Documents clear, commonly understood terminology

What are the components of MHS EA?

MHS Business Processes & Operational Architecture

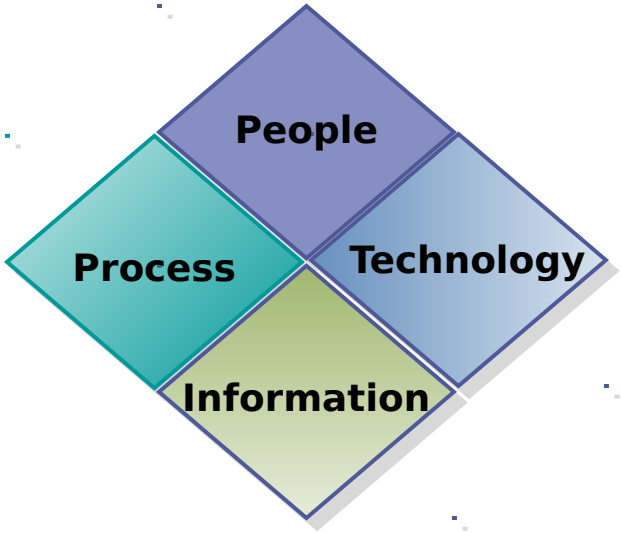
Systems Architecture

Technical Standards Architecture

Challenges

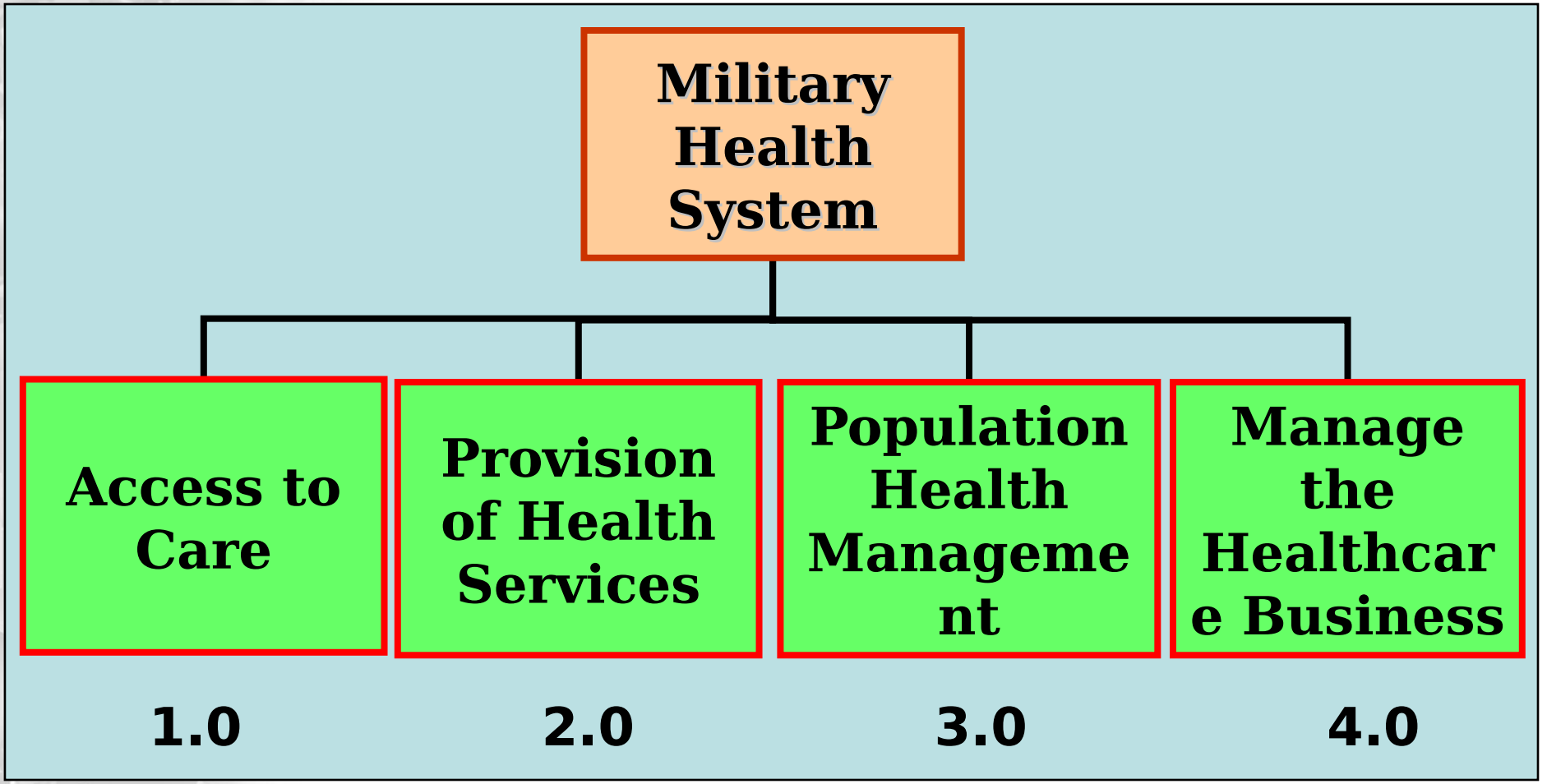
- **Building the right functionality**
- **Avoiding duplicative efforts**
- **Achieving speed to market**
- **Getting high-quality at minimal cost**
- **Adding new capabilities while maintaining installed base**
- **Leveraging other initiatives**

Operational Architecture

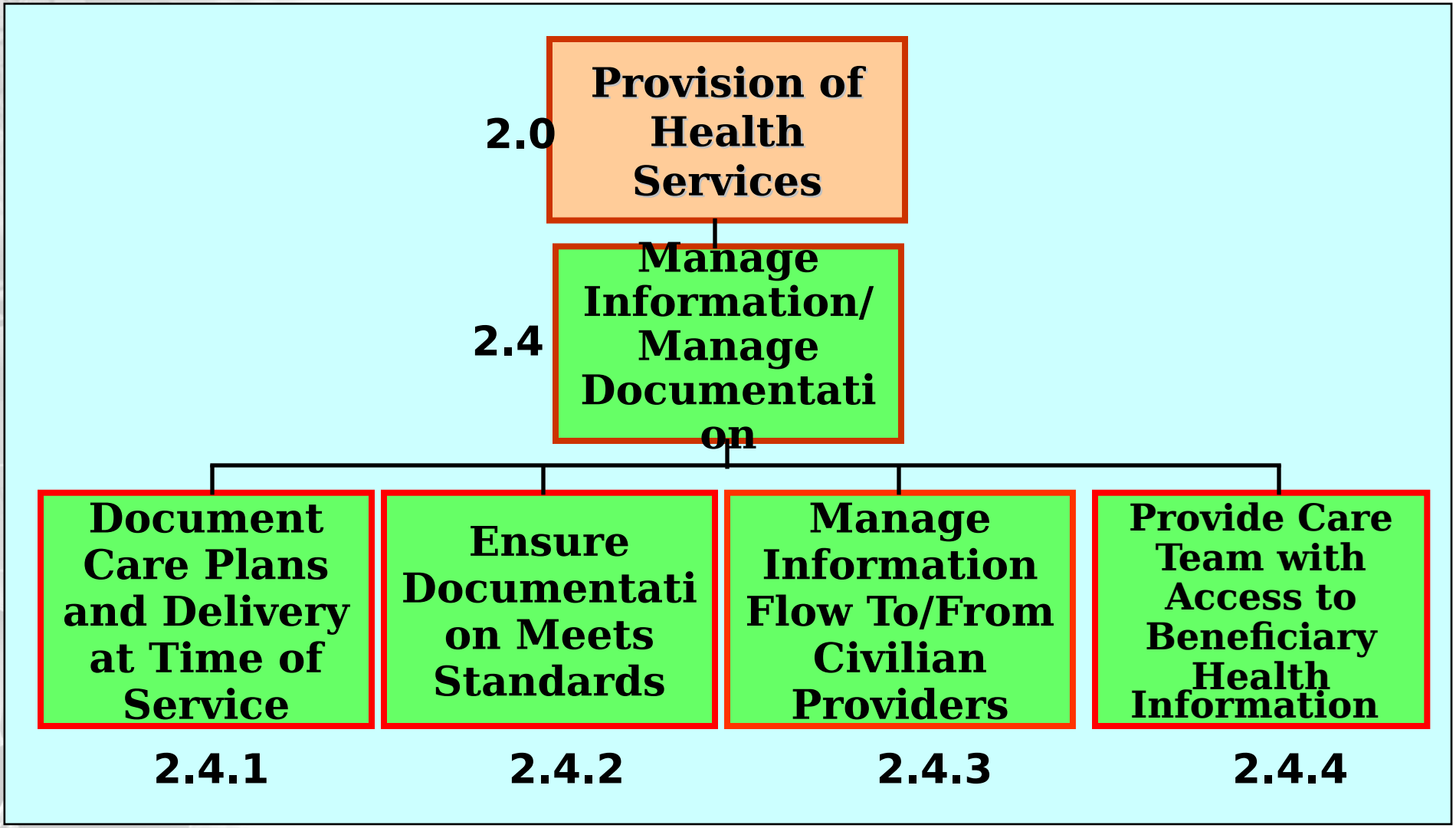


Define business activities, processes, and information requirements

Core Business Processes

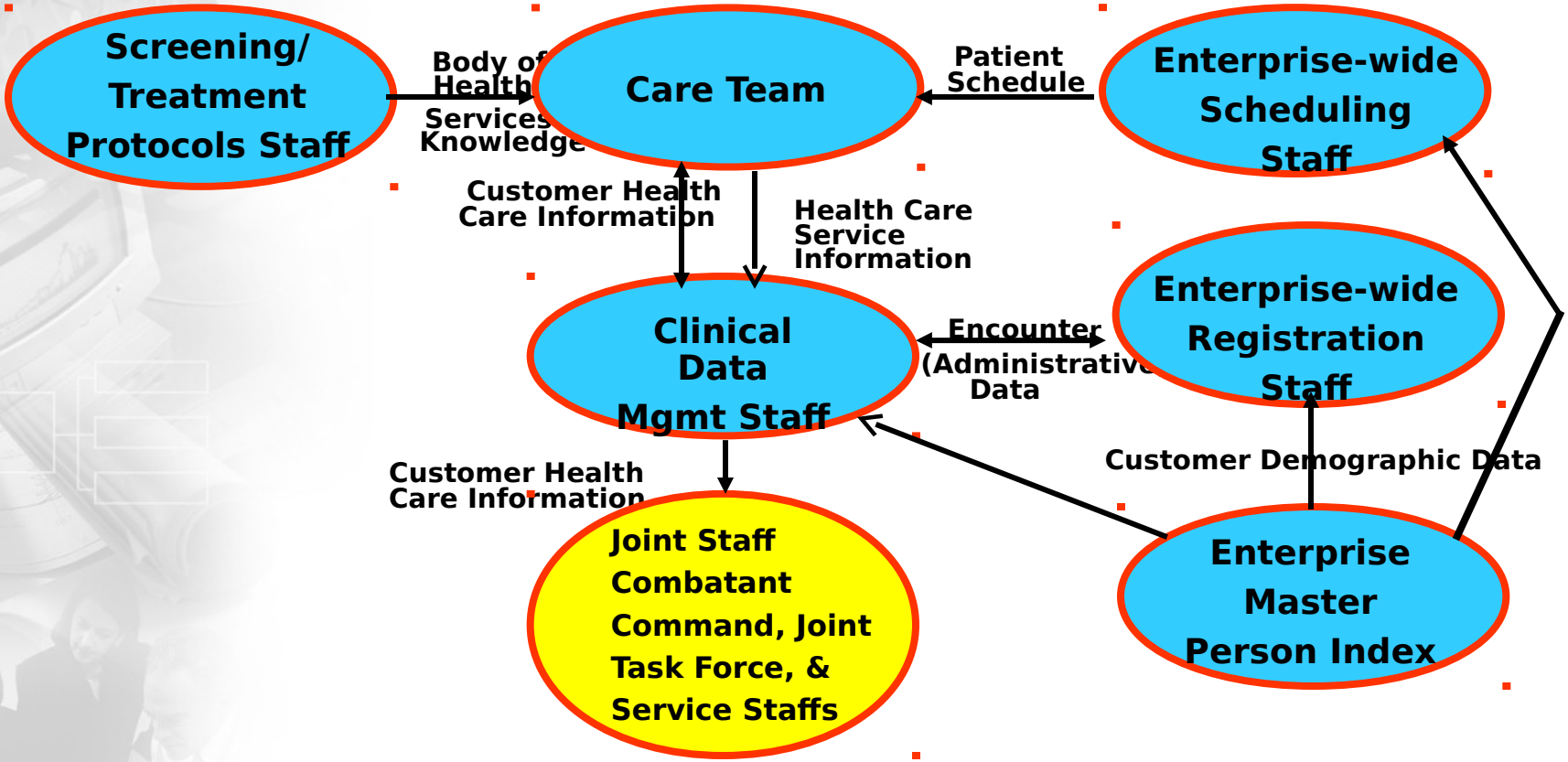


Activity Model

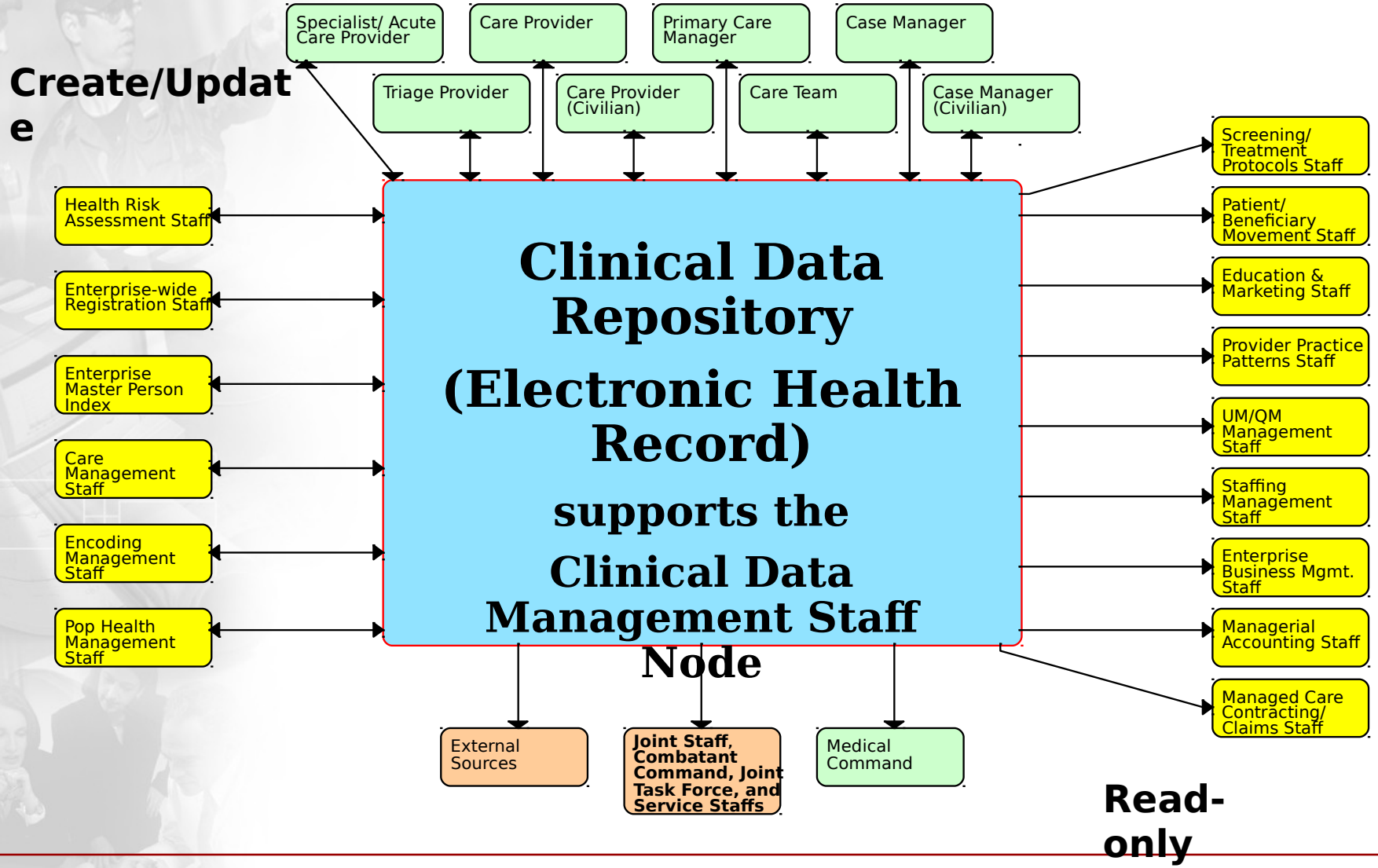


Information Exchange Requirements

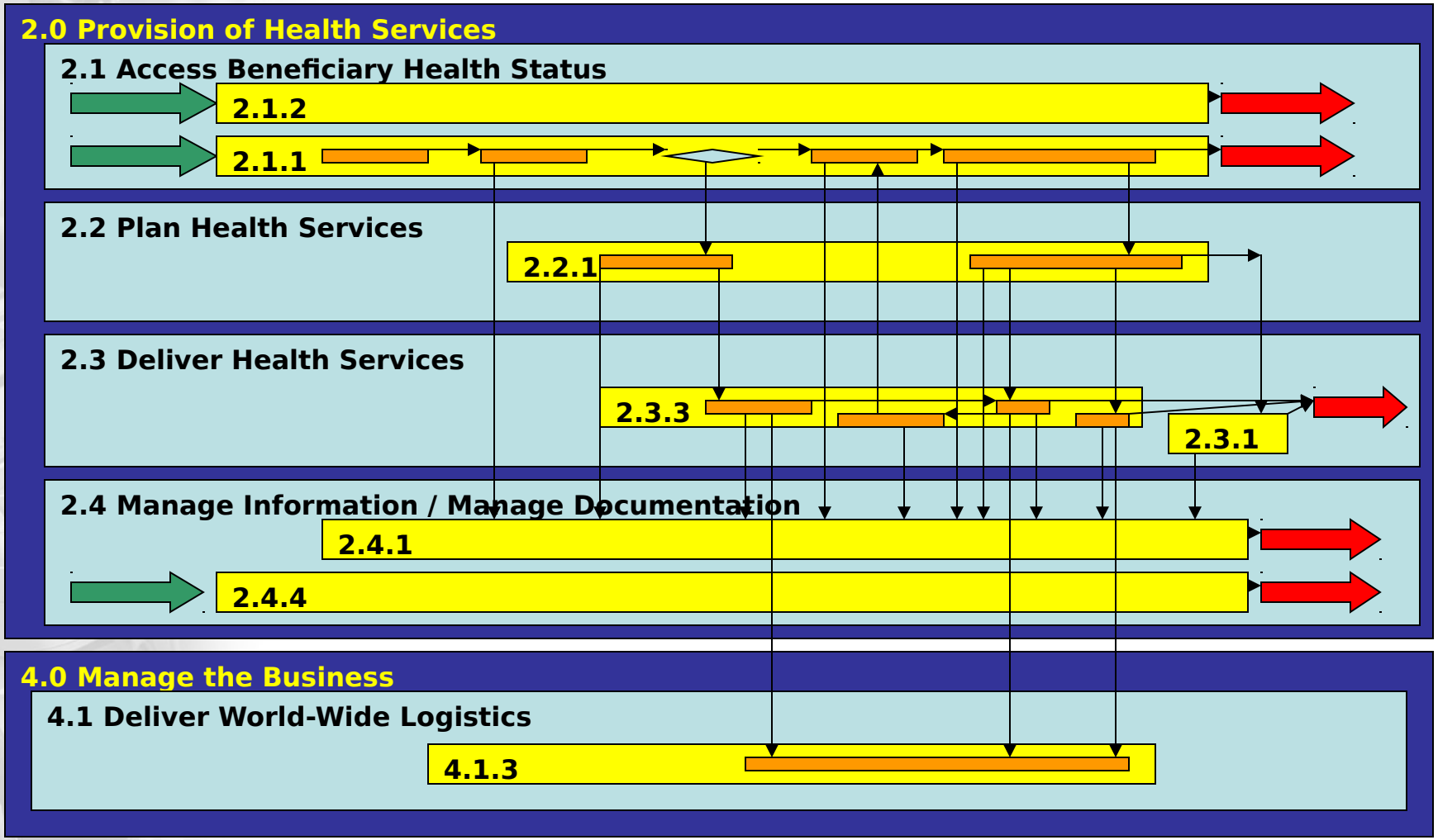
OV-2 2.4.1 Document Care Plans and Delivery at Time of Service



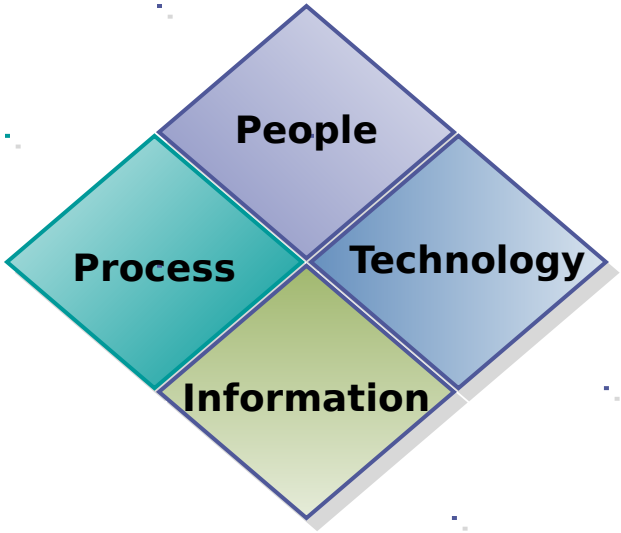
Electronic Health Record Critical Interfaces



Business Process Model



Health Data Architecture

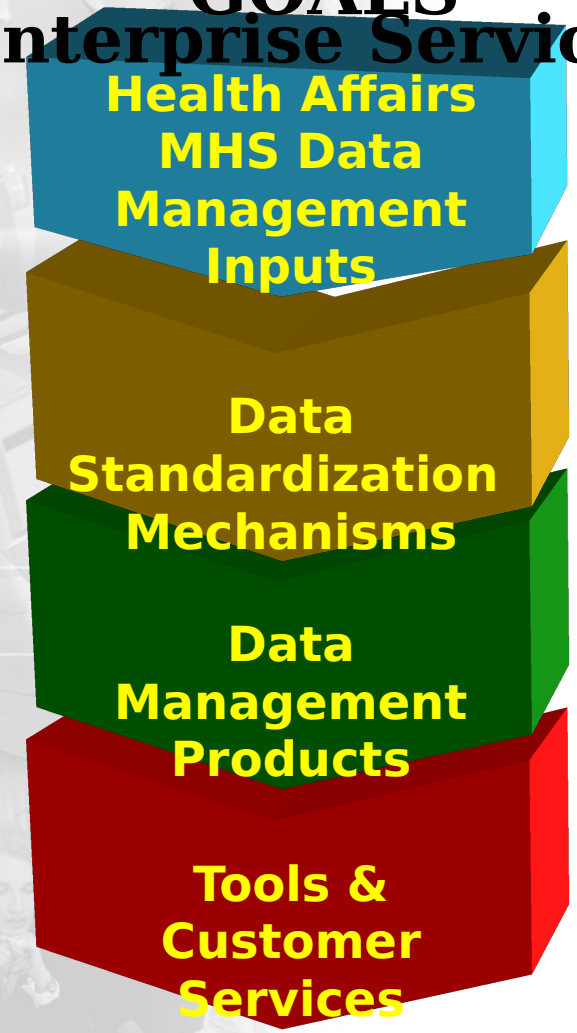


ata architecture and standards supply the structure, context and meaning to information requirements

Managing Information through An Architecture Framework

GOALS

Enterprise Services



Support Net-Centric

Shared Data Environment

Interoperability

Information Exchange Name	No	%
Customer Health Care Information	76	28.4%
Customer Demographic Data	54	20.1%
Encounter (Administrative) Data	54	20.1%
Customer Risk Factors	48	17.9%

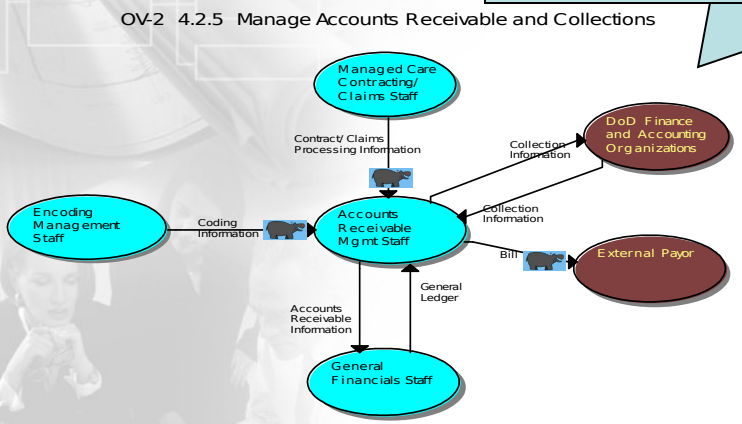
Linking Data Standards to Information Exchange Requirements

- **MHS Enterprise Architecture Version 4.0**
- **Information Exchange ID # 2353: Coding Information**

  Example:

  X12N 837 - Health Care Claim mandated by HIPAA

  Code Set Description: X12N Gender Codes
  - **» F Female**
  - **» M Male**
  - **» U Unknown**



How Business Roles Link Data to Activities

OV- Activities vs. Entities Create, Read Update and Delete (CRUD):
with Role and External Node Addendum

MHS EA Version 4.0

Data Entity	Node that owns the Data Entity	2.1.1 Evaluate Beneficiary Health Status	2.1.2 Monitor Health Status and Progress	2.1.3 Provide Outreach and Follow-up with Beneficiaries	2.2.1 Access Appropriate Guidelines/Protocols and Determine Mu	2.2.2 Collaborate and Partner with Beneficiary	2.2.3 Plan Medical Mission	2.3.1 Conduct Beneficiary and Family Education	2.3.2 Coach Beneficiary in Self-Management and Compliance	2.3.3 Initiate Care Plan and Perform Intervention or Service	2.4.1 Document Care Plans and Deliver at Time of Service	2.4.2 Ensure Documentation Meets Standards	2.4.3 Manage Information Flow To / From Civilian P	2.4.4 Provide Care Team with Access to Be	2.5.1 Manage Transition of Provisio	2.5.2 Manage and Service	2.6.1 Manage and Fa	2.6.2 Monito	2.6
		Comp I		Comp II		Comp III		Comp IV					Comp V		Comp VI				
		2.0 Provision of Health Services																	
Care Management	Care Management Staff	CRUD	RU				R		CRUD			CRUD							
Case Management	Case/Disease Management Staff												R		R				
Beneficiary Financial / Demo	Enrollment / Eligibility Management Staff	R	RU	R	R	RU	R	R	R	RU			R	CRUD	R	R	R	R	
Encounter (Administrative)	Enterprise-wide Registration Staff	CRUD	RU	R	RU		RU	R	R	CRUD	CRUD		CRUD	CRUD	R	R	R	R	
Patient Demographic	Enterprise Master Person Index (EMPI)	R	RU	R	RU	R	R	R	R	CRUD	R		CRUD	R	R	R	R	R	
Clinical History	Clinical Data Mgmt. Staff	CRUD	RU	R	RU	RU	CRUD	R	CRUD	CRUD	CRUD	R	CRUD	R	R	R	R	R	
Assessment	Health Risk Assessment Staff	CRUD	RU	R	R	RU	R	R	R				R	R	R	R	R	R	
Clinical Guidelines	Screening/Treatment Protocols Staff		R	R	CRUD	R	CRUD	R	R	R	R	R	R	R		CRUD	RU	R	
Patient Schedule	Enterprise-wide Scheduling Staff	R	R	R	R	R	CRUD	R	R	R	R		CRUD	R	R	R	R	R	
Referral	Demand/ Referral Mgmt. Staff	R	R	R	RU		RU	R	R	CRUD			RU	R	R	R		R	
Provider Demographics	Provider Registry / Credentialing Staff			R	R		R					R					R	R	R
Provider Schedules																			
Education / Marketing	Education & Marketing Staff			R	R	R	RU	R	RU	R					R	CRUD			R
Patient/Beneficiary Tracking	Patient/Beneficiary Movement Staff						R		R						RU	R	R	R	
Patient Satisfaction	Patient/ Staff Satisfaction Staff																R	R	
Personnel Compensation	Human Resource Management Staff																		
Personnel Performance Review																			
Compensation Guidelines																			
Personnel Incentive Program																			

MHS Data Standards List

Vendors must use MHS Data Standards as specified in the contract language

- **Baseline and Target Standards Listed**
- **Standards for Data Representation, Information Modeling & Message Formats**
- **Examples:**
  - **Lab and Clinical Observation Codes: LOINC**
  - **Multiaxial Medical Nomenclature: SNOMED CT**

Consolidated Health Informatics

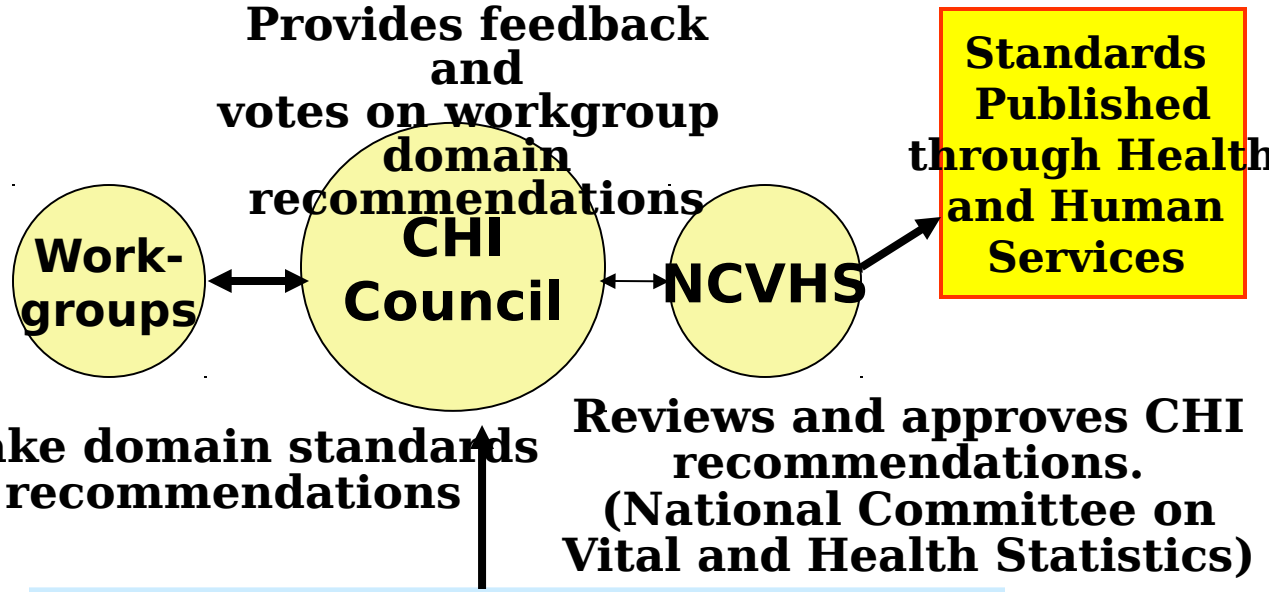
DoD Adopts CHI Recommendations

CHI DOMAINS

[See www.egov.gov for complete set]

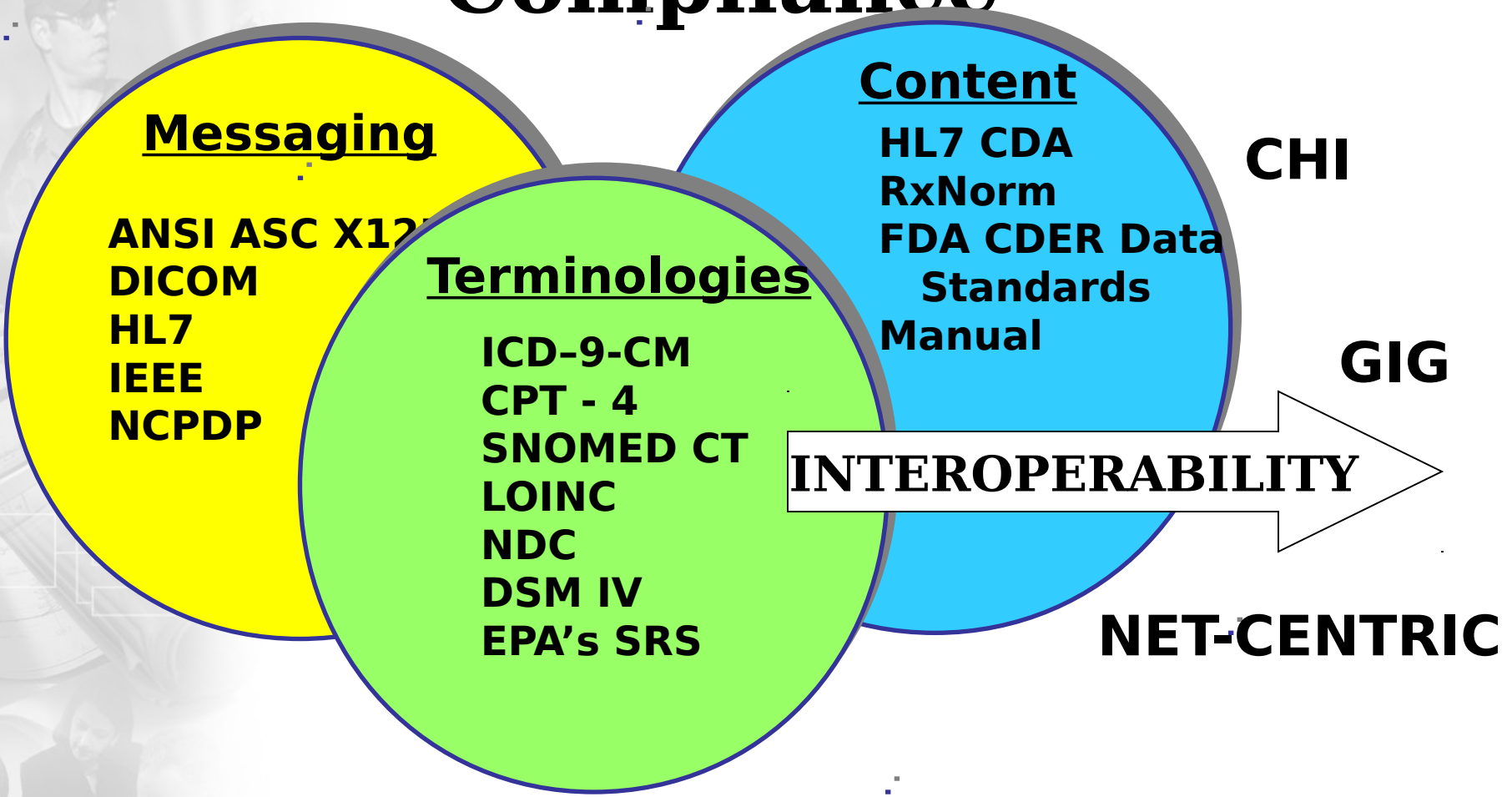
- Anatomy
- Billing/Financial
- Chemicals
- Demographics
- Diagnosis and Problem List
- Encounters
- Genes
- Immunizations

and more……..



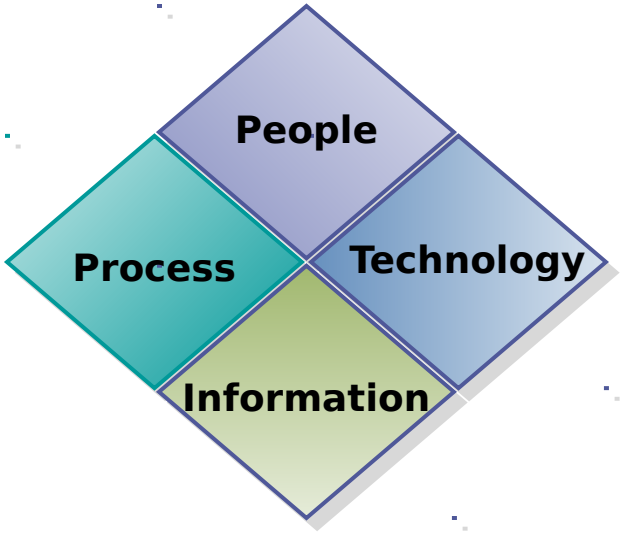
Federal Agency Partners

Health Data Standards Compliance



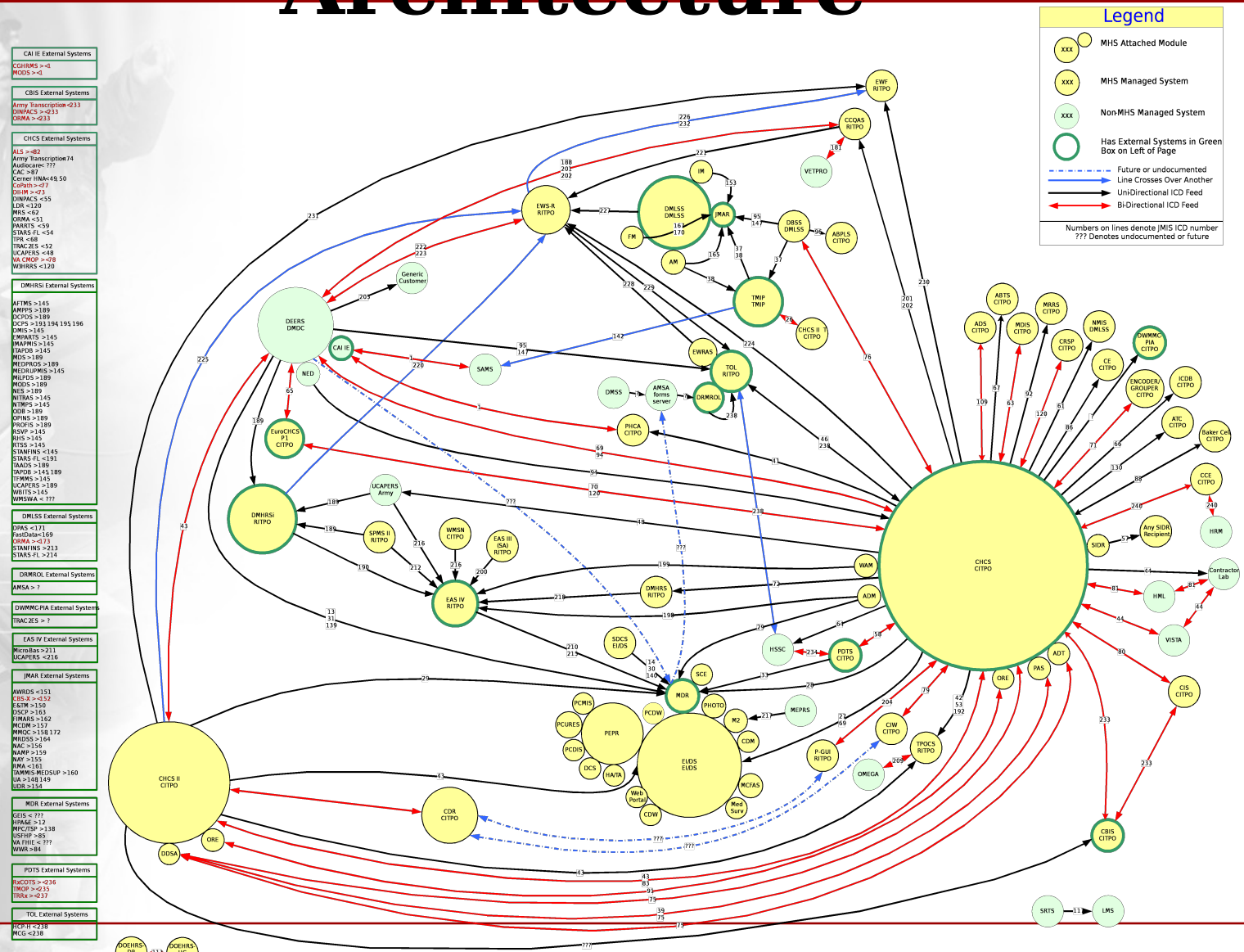
Determine the standards you must follow

System Architecture

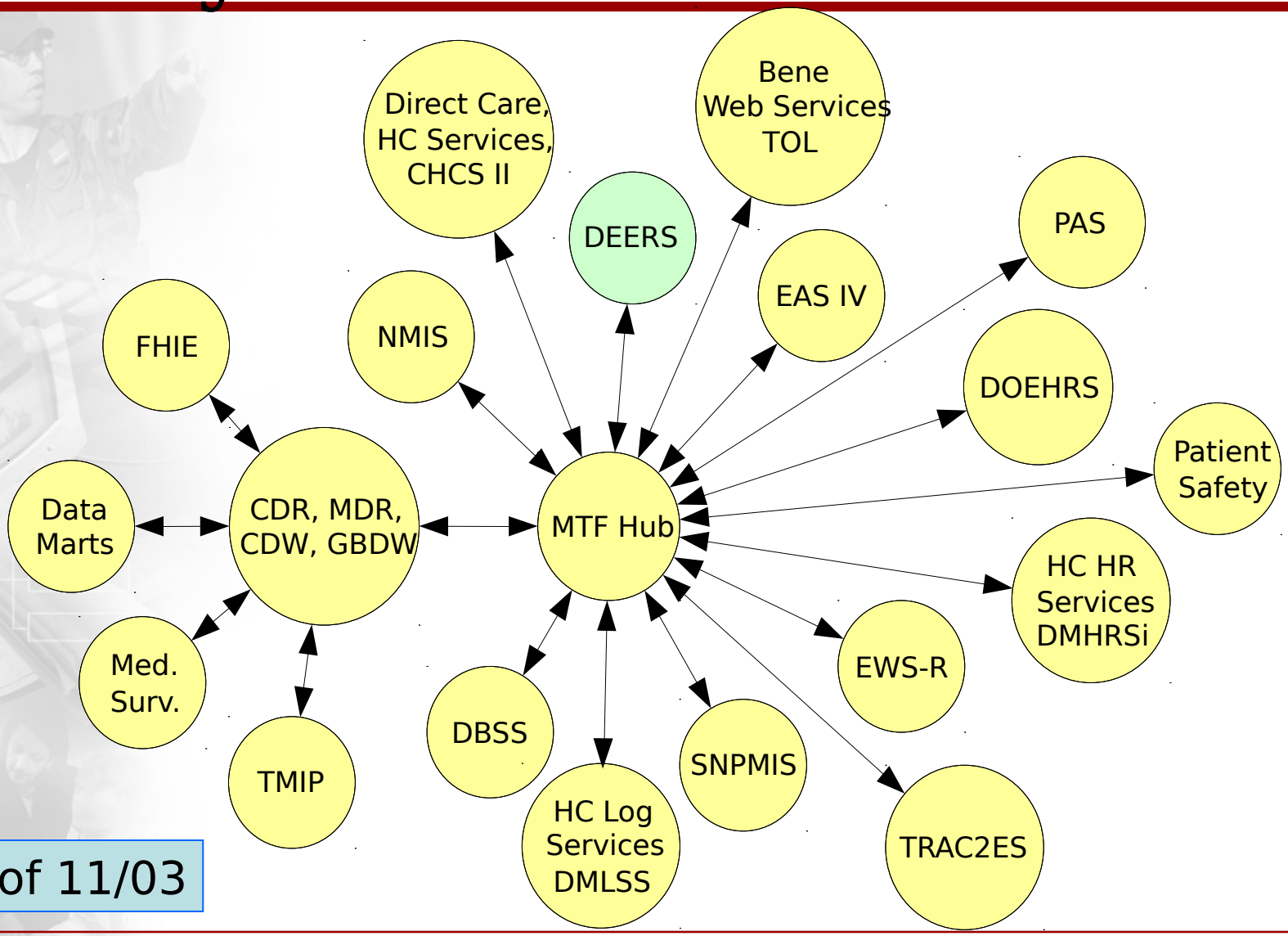


Identify applications and be able to map them to business capabilities

Military Health System "As-Is" Application Architecture



Sample "To-Be" System Architecture



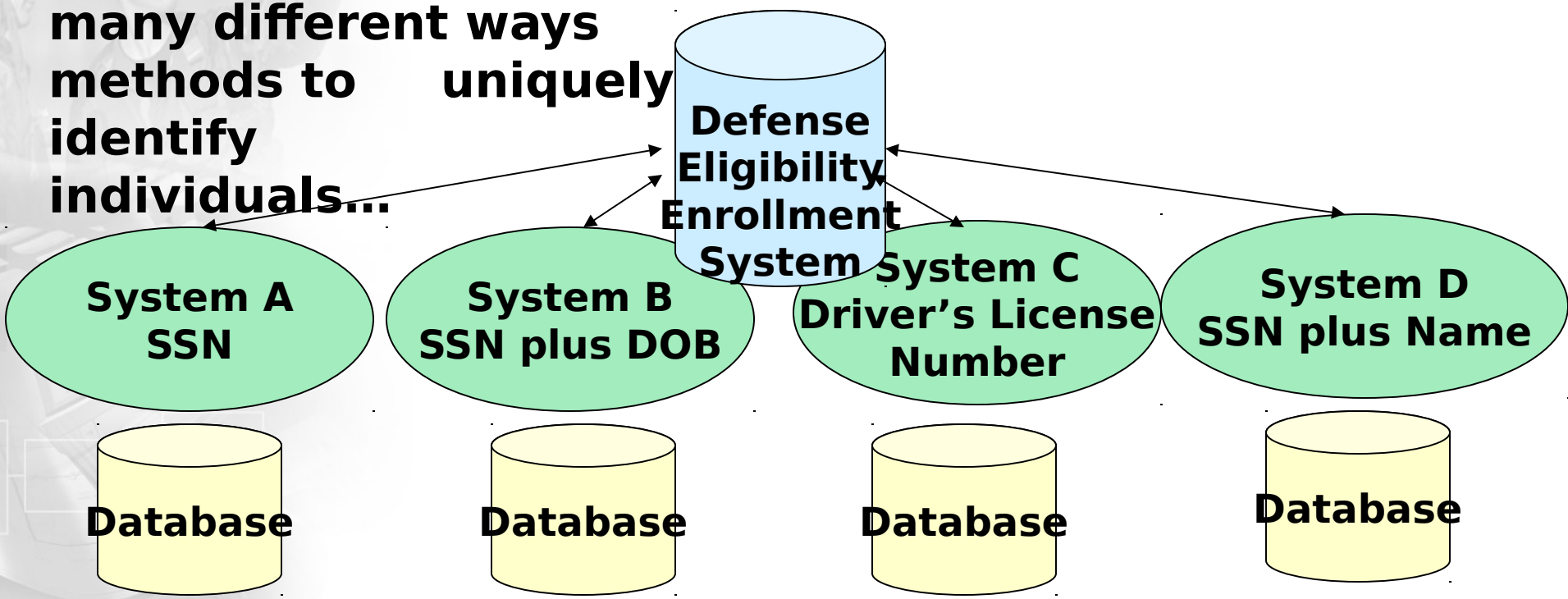
As of 11/03

Potential Opportunities for Service- Oriented Architecture Components

- **Patient or Person Identification Service (PIDS) and MSI**
- **Security (IAA)**
- **Data Dictionary & Lexical Services**
- **Local Data Store**
- **Messaging & Logical Transformation**
- **Workflow Services**
- **Order Entry**
- **Results Retrieval**
- **Encounter Documentation**

Example: Using Service-Oriented Architecture (SOA) for Person Identification

AS IS: We currently use many different ways methods to uniquely identify individuals…

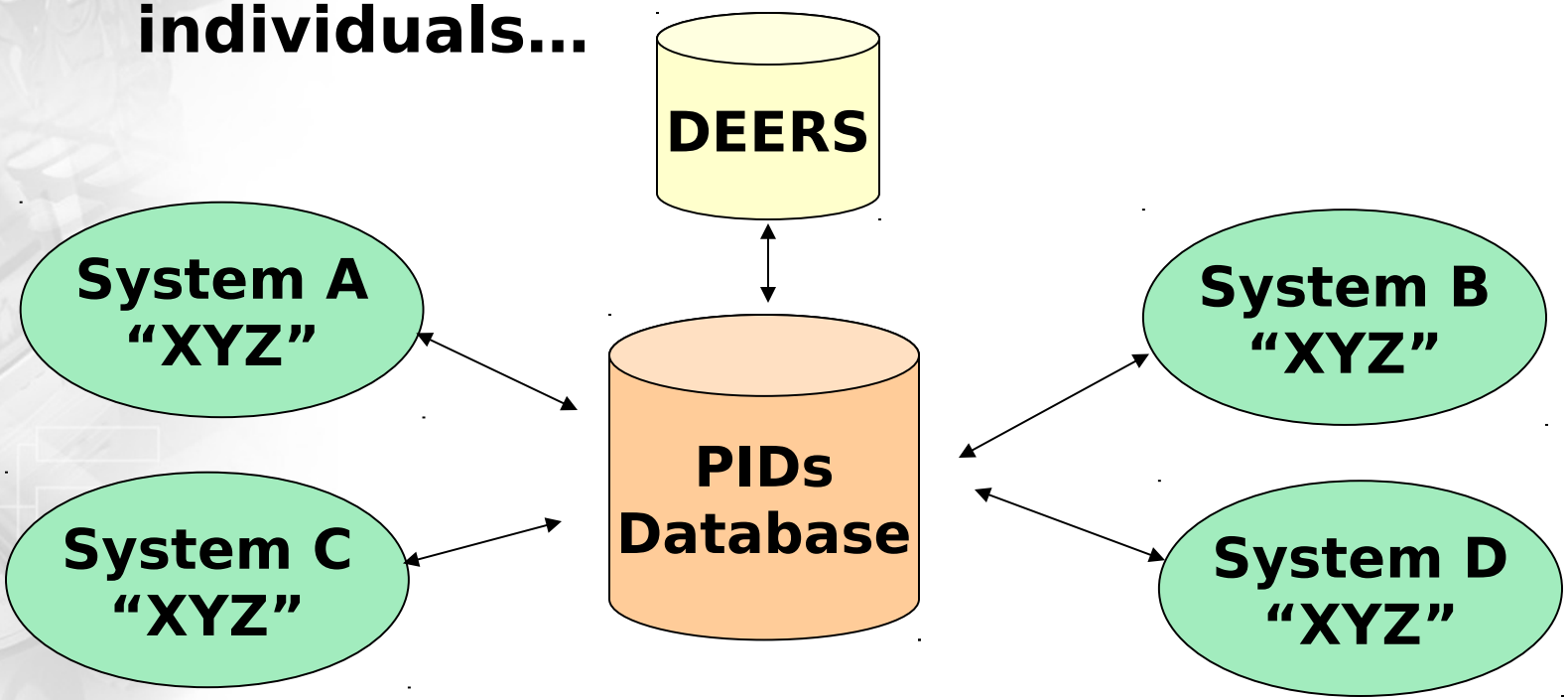


Which means every system maintains:

- **A database of individuals**
- **A DEERS interface**

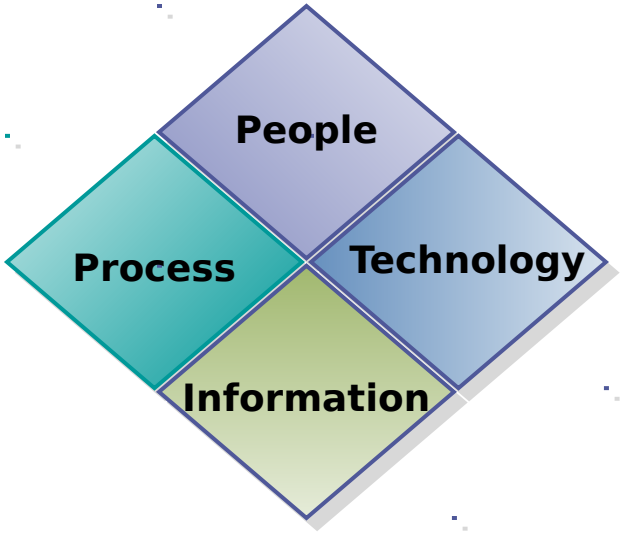
Example: Using Service-Oriented Architecture (SOA) for Person Identification

TO BE: Standardizing the method used to uniquely identify individuals…



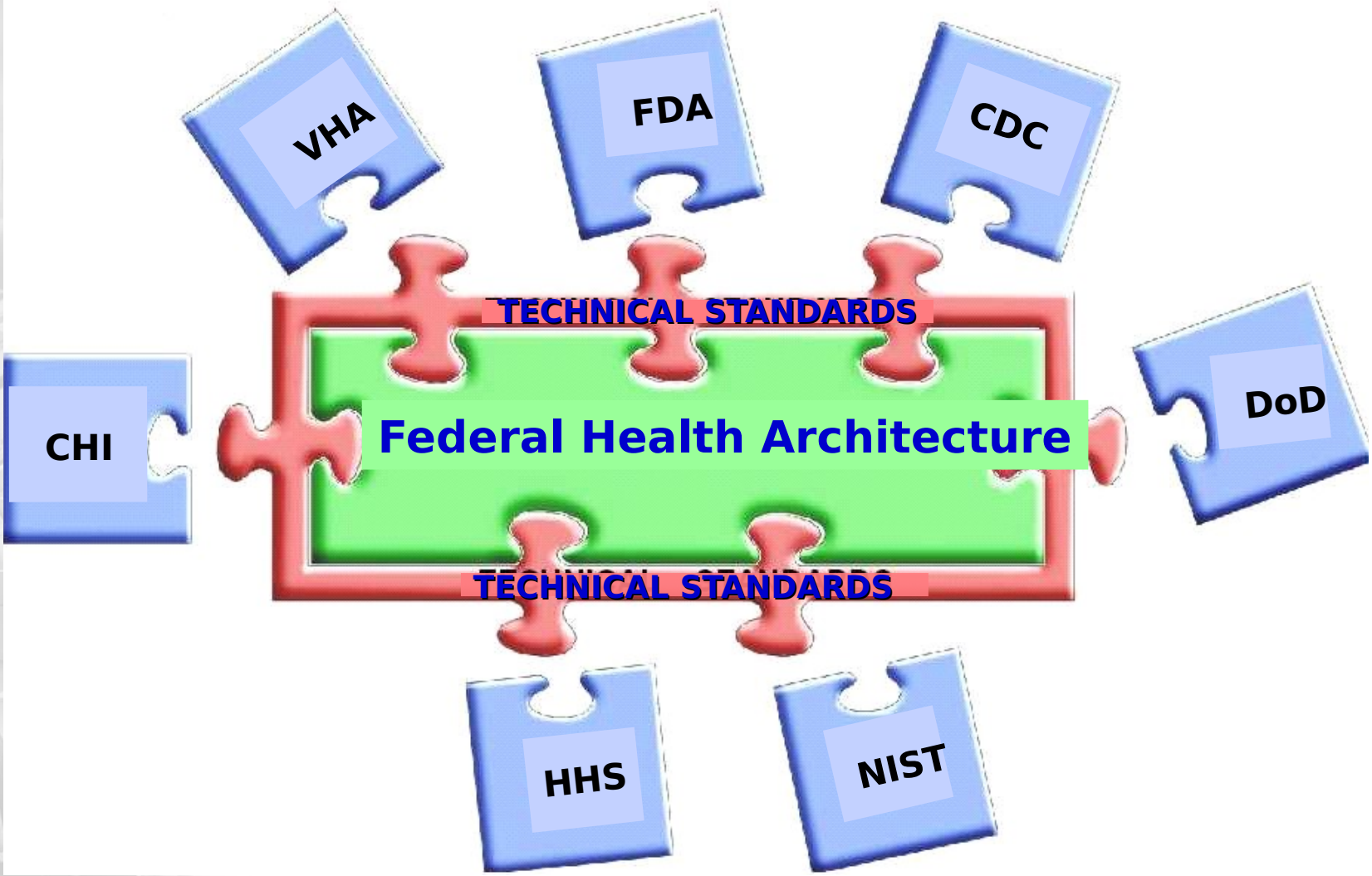
Allows one Patient Database and DEERS Interface to support all systems…

Technical Standards Architecture

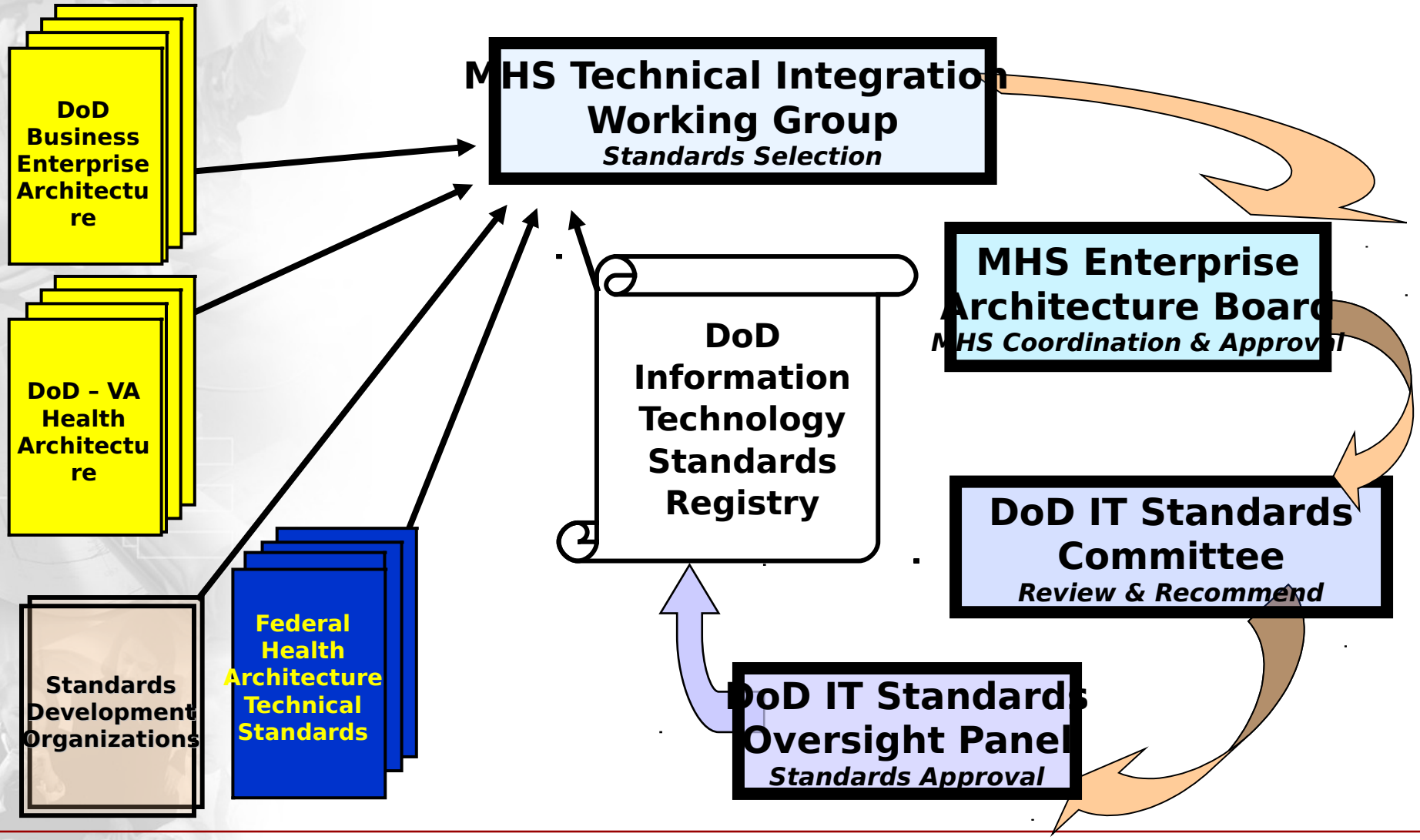


Determine the technical standards that support interoperability

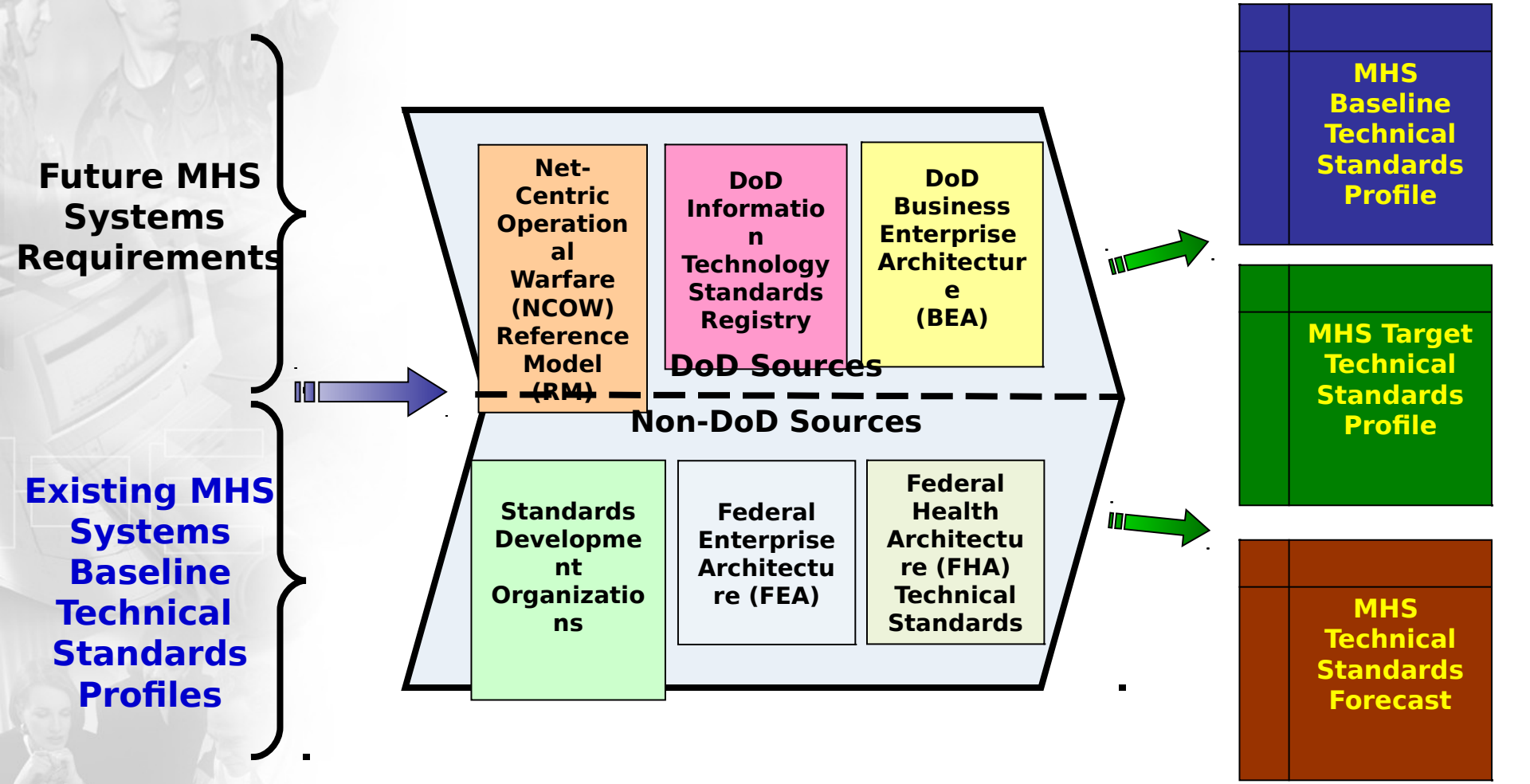
Federal Standards Collaboration Process



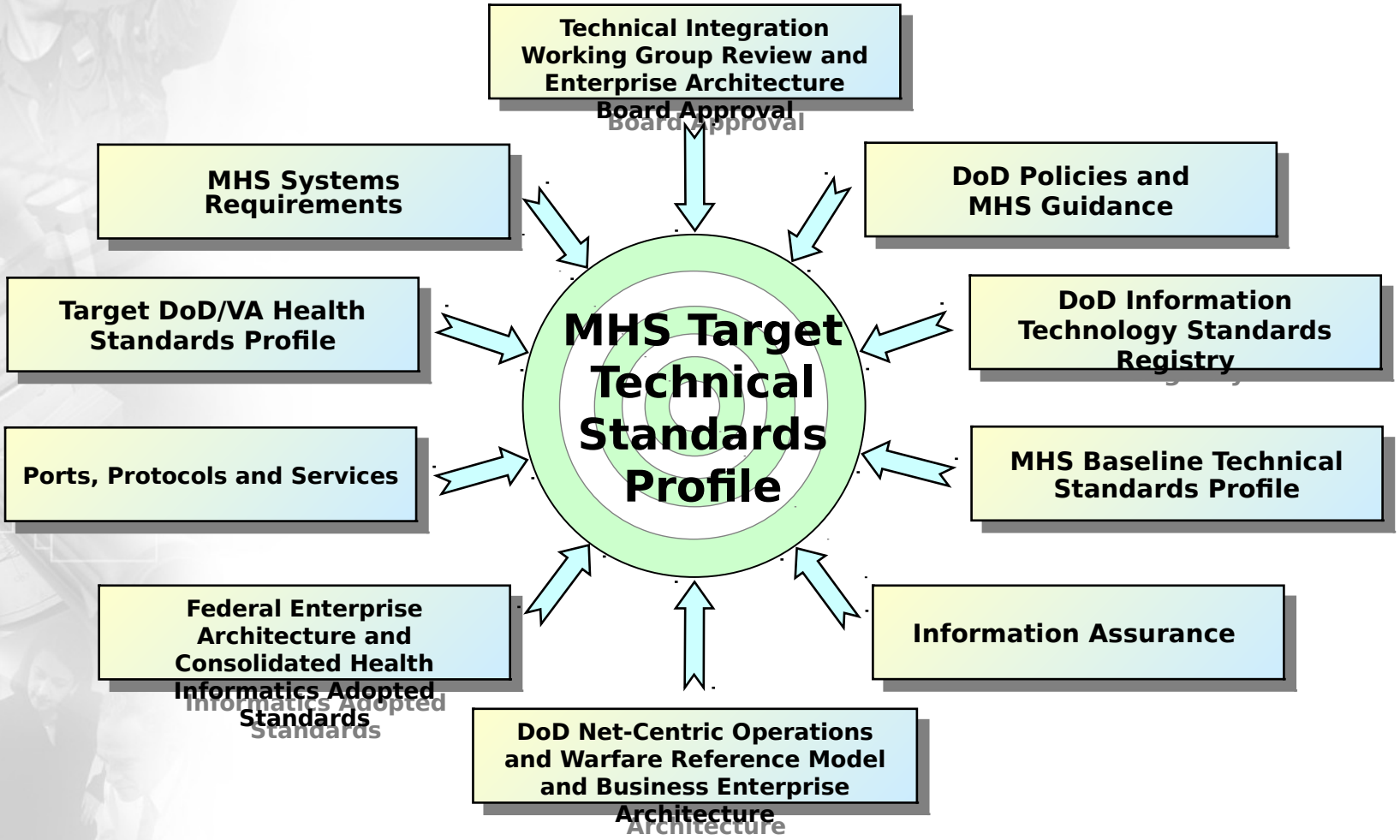
Technical Standards Process



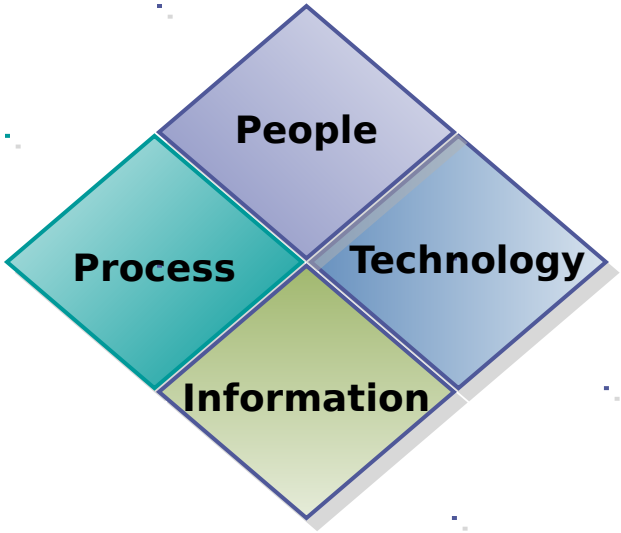
Technical Standards Product Development



Target Technical Standards Profile



Information Assurance Architecture

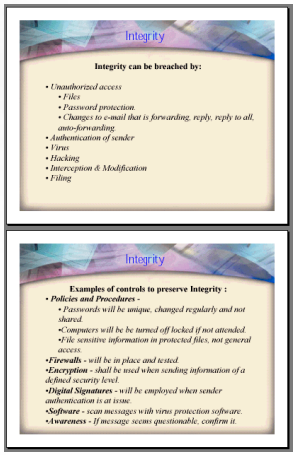


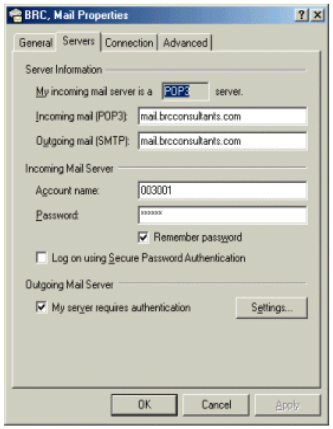
Define the protection mechanisms for the enterprise environment

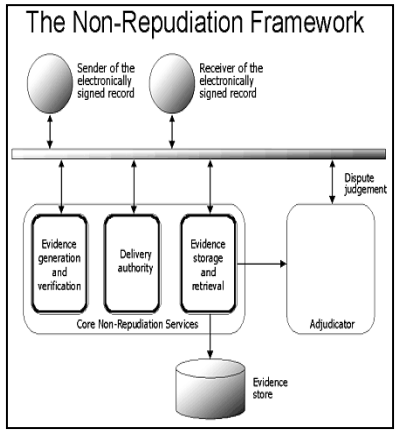
Applying Information Assurance to Enterprise Architecture

The Principles of Information Assurance are…

Confidentiality Integrity Availability Authentication Non-repudiatio







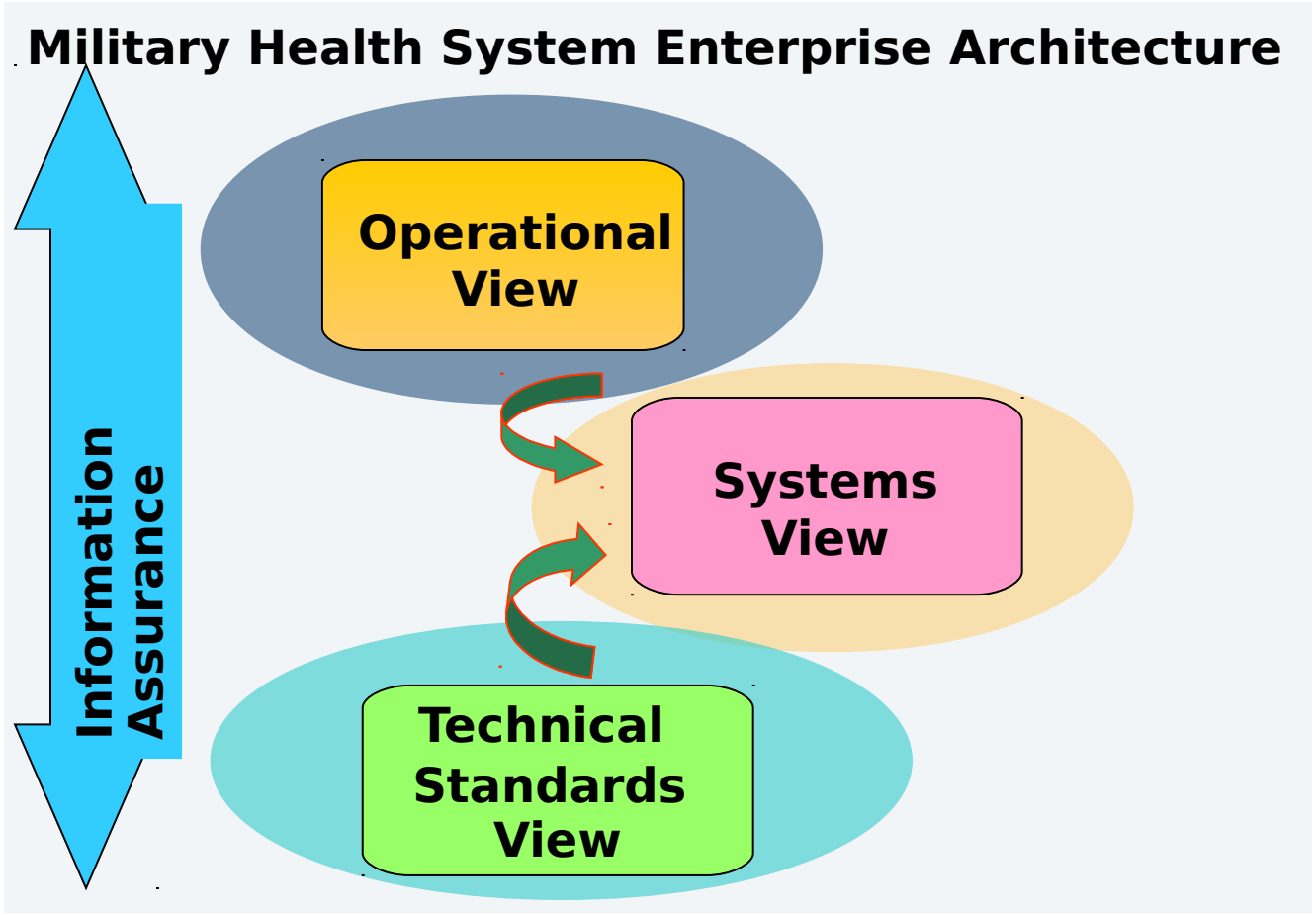
Applying Information Assurance to Enterprise Architecture

…clearly in focus when developing the policies, standards and processes of the Enterprise Architecture…

Policies

Standards

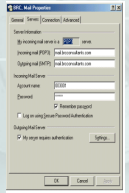
Processes

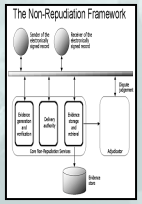


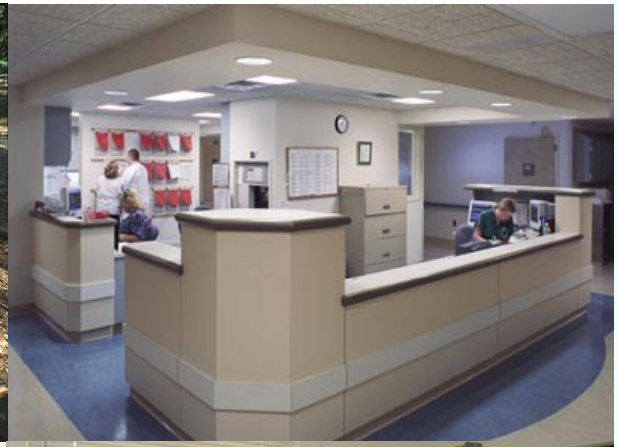
Applying Information Assurance to Enterprise Architecture

…Ensures protection and security of Patient Information for the Military Health System!

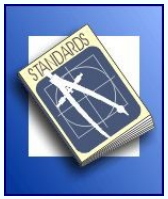
Principles of IA

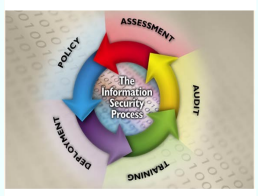




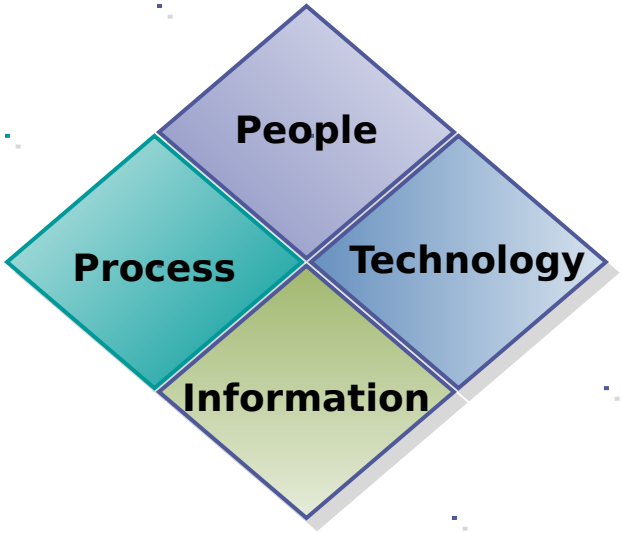


Policies
Standards
Processes



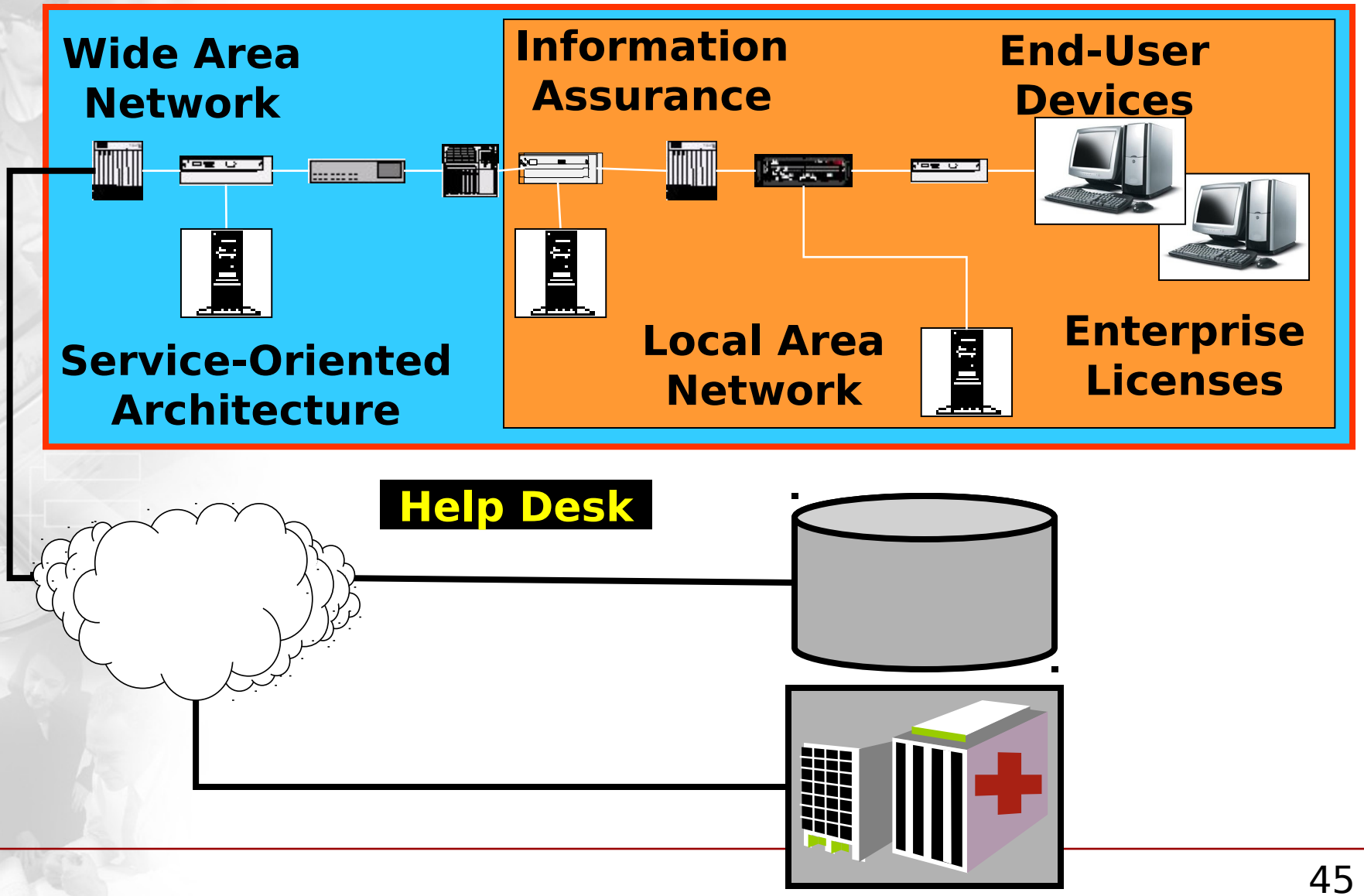


Summary



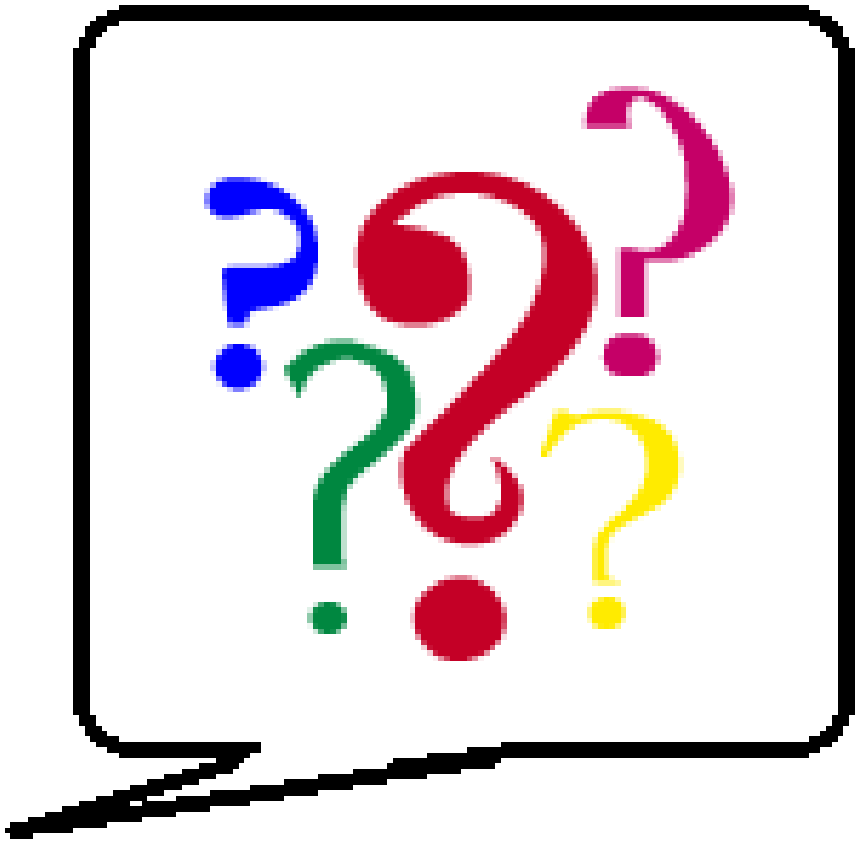
Enterprise Architecture is a disciplined approach to managing business modernization efforts and making sound IT investments

Military Health System Common Services



What does this mean for you?

- **Understand EA constructs and uses**
- **Use EA common terminology**
- **Use standard contract language in procurements to drive technical, data, security, and communication interoperability**
- **Promote efficiencies through common services, enterprise licenses, and Services Oriented Architecture**
- **Leverage innovation and state-of-the shelf technologies**
- **Eliminate duplication and redundancies**



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